What Is Claimed Is:

1.   A method for determining a pulse characteristic of a transmitted pulse, comprising the steps of

    a. transmitting a first pulse having a first pulse characteristic;

    b. receiving said transmitted pulse having said first pulse characteristic;

    c. determining multipath response characteristic of said received first pulse; and

    d. determining a second pulse characteristic of a second transmitted pulse based on said multipath response characteristic.

2.   The method according to claim 1, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse position in time.

3.   The method according to claim 2, wherein said multipath response characteristic comprises a zero crossing point and wherein said first pulse is positioned at said zero crossing point.

4.   The method according to claim 3, wherein said zero crossing minimizes coupling between said first pulse and said second pulse.

5.   The method according to claim 2, wherein said multipath response characteristic comprises a maximum response point and wherein said first pulse is positioned at said maximum response point.

6.   The method according to claim 5, wherein the signal of said first pulse is enhanced by the multipath signal of said second pulse.

7.   The method according to claim 1, further comprising the steps of:

    transmitting said first pulse having said first pulse characteristic and said second pulse having said second pulse characteristic;

receiving said first pulse having said first pulse characteristic and said second pulse having said second pulse characteristic; and

separating the multipath response of said first pulse from said multipath response of said second pulse by solving simultaneous equations.

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8.   The method according to claim 1, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse amplitude characteristic.

9.   The method according to claim 1, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse width characteristic.

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10.   The method according to claim 1, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse polarity characteristic.

15   11.   The method according to claim 10, wherein said pulse polarity characteristic comprises whether a pulse is inverted.

12.   The method according to claim 1, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse type characteristic.

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13   The method according to claim 12, wherein said pulse type characteristic comprises at least one of:

a square wave pulse;

a sawtooth pulse;

25   a Haar wavelet pulse;

a gaussian monopulse;

a doublet pulse;

a triplet pulse; and

a set of wavelets.

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14.   A system, comprising:

a first transceiver capable of transmitting a first pulse, said pulse having a

first pulse characteristic;

a second transceiver capable of receiving said transmitted first pulse having said first pulse characteristic;

said second tranceiver capable of determining multipath response characteristics of said received first pulse; and

said second transceiver capable of determining a second pulse characteristic of a second pulse based on said multipath response characteristic.

15. The system according to claim 14, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse position in time.

16. The system according to claim 15, wherein said multipath response characteristic comprises a zero crossing point and wherein said first pulse is positioned at said zero crossing point.

17. The system according to claim 16, wherein said zero crossing minimizes coupling between said first pulse and said second pulse.

18. The system according to claim 15, wherein said multipath response characteristic comprises a maximum response point and wherein said first pulse is positioned at said maximum response point.

19. The system according to claim 18, wherein the signal of said first pulse is enhanced by the multipath signal of said second pulse.

20. The system according to claim 14, wherein said second tranceiver is capable of separating the multipath response of said first pulse from said multipath response of said second pulse by solving simultaneous equations.

21. The method according to claim 14, wherein a pulse characteristic of at least one of said first and second pulse characteristic corresponds to a pulse amplitude characteristic.

22.   The method according to claim 14, wherein a pulse characteristic of at least one of said first and second pulse characteristic corresponds to a pulse width characteristic.

23.   The method according to claim 14, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse polarity characteristic.

24   The method according to claim 23, wherein said pulse polarity characteristic comprises whether a pulse is inverted.

25.   The method according to claim 14, wherein a pulse characteristic of said first and second pulse characteristic corresponds to a pulse type characteristic.

26.   The method according to claim 25, wherein said pulse type characteristic comprises at least one of:

a square wave pulse;

a sawtooth pulse;

a Hanr wavelet pulse;

a gaussian monopulse;

a doublet pulse;

a triplet pulse; and

a set of wavelets.

27.   A method for separating the multipath responses of a plurality of pulses, comprising the steps of:

transmitting a plurality of pulses having predefined pulse characteristic, wherein a predefined pulse characteristic corresponds to a pulse position in time;

receiving the plurality of pulses in accordance with said predefined pulse characteristic;

determining cross coupling value for a first pulse relative to a second pulse; and

separating the multipath response of said first pulse from the multipath response of said second pulse using said at least one cross coupling value.

28.   The method according to claim 27, wherein said cross coupling value is determined adaptively to maintain operation in the resence of scenario dynamics, wherein said scenario dynamics comprises motion of an object in the environment, motion of a transmitter, and motion of a receiver.

29.   The method according to claim 27, wherein said plurality of pulses is subdivided into pulse groups interspersed with time periods without pulses.

30.   The method according to claim 29, wherein a time period without pulses allows for the decay of multipath energy produced by the preceding pulse group.

31.   The method according to claim 29, wherein said time periods without pulses allow for reception of pulses between transmissions of pulse groups.

32.   A method for determining characteristics of a pulse comprising the steps of:

transmitting from a first transceiver, a pulse having a first pulse characteristic, wherein said pulse characteristic corresponds to a pulse position in time;

receiving at a second transceiver said transmitted pulse in accordance with said first pulse characteristic;

determining at said second transceiver a multipath response characteristic of said received pulse;

determining at said second transceiver a second pulse characteristic of said pulse using said multipath response characteristic, wherein a pulse characteristic corresponds to a pulse position in time;

communicating from said second transceiver to said first transceiver said second pulse characteristic of said pulse; and

transmitting from and receiving at said first and second transceiver a pulse

having said second pulse characteristic.

33.   A system, comprising:

a first transceiver capable of transmitting a pulse having a first pulse

5   characteristic, wherein a pulse characteristic corresponds to a pulse position in

time;

a second transceiver capable of receiving said transmitted pulse in

accordance with said first pulse characteristic;

said second transceiver capable of determining multipath response

10   characteristic of said received pulse;

said second transceiver capable of determining a second pulse

characteristic of pulse using said multipath response characteristic, wherein a

pulse characteristic corresponds to a pulse position in time;

said second transceiver capable of communicating said second pulse

15   characteristic of said pulse to said first transceiver; and

said first and second transceiver capable of transmitting and receiving a

pulse having said second pulse characteristic.

34.   A method for determining a pulse characteristic, comprising the steps of:

20   transmitting from a first transceiver, a pulse having a first pulse

characteristic, wherein said first pulse characteristic corresponds to a pulse

position in time;

receiving at a second transceiver said transmitted pulse in accordance

with said first pulse characteristic;

25   determining at said second transceiver a multipath response characteristic

of said received pulse;

determining at said second transceiver a second pulse characteristic of

said pulse using said multipath response characteristic, wherein said pulse

characteristic corresponds to a pulse position in time;

30   transmitting from said second transceiver, a pulse having said second

pulse characteristic;

searching for and receiving at said first transceiver said transmitted pulse

having said second pulse characteristic;

transmitting from and receiving at said first and second transceiver at least one pulse having said second pulse characteristic.

5   35.   A system, comprising:

a first transceiver capable of transmitting pulse having a first pulse characteristic, wherein said pulse characteristic corresponds to a pulse position in time;

a second transceiver capable of receiving said transmitted pulse in
10   accordance with said first pulse characteristic, said second transceiver capable of determining a multipath response characteristic of said received pulse;

said second transceiver capable of determining a second pulse characteristic of said pulse using said multipath response characteristic, wherein said pulse characteristic corresponds to a pulse position in time;
15   said second transceiver capable of transmitting a pulse having said second pulse characteristic; and

said first transceiver capable of searching for and receiving said transmitted pulse having said second pulse characteristic, said first and second transceiver capable of transmitting and receiving a pulse having said second
20   pulse characteristic.

36.   A method for positioning a pulse, comprising the step of:

positioning said pulse in time based on the multipath response of a preceding pulse.

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